

## SECTION 1: HISTORY OF MAJOR/MINOR CLASSIFICATION

The classification of “major” vs. “minor” repairs and alterations has been a concern since the earliest days of aviation safety regulation. A memo on this subject to the Civil Aeronautics Board (CAB) dated March 7, 1941, from the Chief of the Safety Rules and Education Division stated, “It would be safe to say that no regulation affecting civil aeronautics has caused so many inconveniences, delays and confusions as this particular provision.”

The first general regulation on aeronautical repairs and alterations was issued by the Aeronautics Branch of the Department of Commerce as Aeronautics Bulletin No. 7-H effective January 1, 1931. The overall concept of the distinctions between major and minor repairs and between repairs and alterations and the impact of those distinctions is evident in that regulation. It is also evident that the original concept and the issues and problems that flow from that concept have changed very little in the intervening years.

Section 1, “Application of Regulations” of the 1931 regulation reads as follows:

(A) A licensed aircraft which has been altered in such a manner as to affect the structure, balance, carrying capacity, or general airworthiness of the aircraft shall not be flown until technical data in accordance with section 36 have been submitted to and approved by the Secretary of Commerce and an authorized representative of the Secretary has inspected and approved the alterations.

(B) A licensed aircraft which is slightly damaged, but not damaged to such an extent as to come within the meaning of section 1(C) shall not be flown until it has been fully repaired and such repairs approved by a licensed mechanic. The repair and approval must be noted in the airplane log, together with the signature of the mechanic involved.

(C) When a licensed aircraft or a major component thereof, such as the fuselage, tail surfaces, control system, wings, or landing gear, has been damaged to such an extent that it constitutes a major repair in the judgment of the Department of Commerce inspector, the airplane shall not be flown until the requirements of these regulations have been completely fulfilled and the repairs have been approved by a Department of Commerce inspector.

Section 5, “Technical Data” of the 1931 regulation reads as follows:

A repair station holding an approved repair station certificate may make major repairs in accordance with the original design on aircraft of the class or classes of structure specified in the terms of its certificate. No stress analysis, drawings, or other technical data will be required for such repairs, except as otherwise specified in Chapter IV of these regulations, and except as may be deemed necessary in special cases by the Secretary of Commerce. In cases where no technical data are required the repaired aircraft may be eligible for license upon approval by a Department of Commerce inspector. In cases requiring technical data, the repaired

aircraft may be eligible for license upon approval of such data and an inspection by a Department of Commerce inspector.”

Section 20 of the 1931 regulation was titled, “Classification According to Extent of Damage.” The section stated that in any case where the extent of damage was not clearly defined the final decision would “be made by the inspector for the Department of Commerce.” While there was no definition of “minor repair,” subdivision (E) (what we now refer to as a paragraph) stated: “Repairs of less importance and less magnitude than those listed in subdivision (D) above may be classed as minor repairs, and may be repaired in accordance with the provisions of section 1(B) in which case no technical data of any kind will be required.”

It is clear from the history of the Federal Aviation Regulations that the word “repair” has been used to mean fixing or restoring something on an aircraft, that was damaged, in order that the aircraft continues to meet its certification basis. This use of the word “repair” is consistent with its dictionary definition. If a repair was considered minor no technical data was needed to accomplish the repair (Bulletin No. 7-H), although the fact of the repair and the signature of the licensed mechanic who approved the repair had to be noted in the aircraft log. If a repair was major it had to be accomplished in accordance with approved data. In all major repair cases a Department of Commerce inspector had to approve the repair. If technical data needed to be developed before the repair could be made, a Department of Commerce inspector also had to approve that data.

While “alteration” was not defined, it is clear that from the 1931 regulation that, as with “repair,” the Department of Commerce was using alteration in its normal dictionary meaning, that is, to make something different without changing it into something else. While the original regulation did not use the terms major and minor with respect to alteration, the 1931 rule language distinguished between types of alterations with the same effect as if it had. It did not require all alterations to be supported by technical data or to be inspected and approved by a Department of Commerce inspector. Rather, it applied these requirements only to alterations that affected “the structure, balance, carrying capacity or general airworthiness of the aircraft.” This applicability requirement came very close to today’s definition of a “major alteration.”

By 1940 the applicable regulation had evolved into part 18 of 14 CFR (which was the predecessor to current part 43). Section 18.1 addressed both major and minor repairs as follows:

**18.1 TYPES OF REPAIR.** An aircraft will be deemed to have been repaired when

18.10(a) any non-structural member (such as a fairing, cowlings or turtleback; 5 percent or less of the surface of a fabric covered wing or control surface; not more than two adjacent wing ribs; and the trailing edge of a wing or control surface) has been repaired, or when a structural component (such as a wheel; a landing gear, wing or control surface strut; and a control surface, but excluding a wing panel and a landing gear) has

been replaced by one purchased from the original manufacturer, in which cases the repair will be designated as a minor repair, or when

18.11(b) any structural member (such as a spar; a wing or control surface leading edge or tip strip; a control surface rib; three or more adjacent wing ribs; a wing or cabin strut wire; a wing compression member; a fitting; a landing gear or tail surface strut or wire; a fuselage longeron, cross tube, diagonal or bulkhead; any portion of the wooden or metal cover of a stressed-skin wing, control surface, fuselage or landing gear; and any bracket supporting a seat, baggage compartment, fixed equipment or control system part) has been repaired or replaced, in which case the repair will be designated as a major repair, or when...

As was true in the 1931 regulation, part 18 did not distinguish between major and minor alterations. Rather, it described those alterations that would be considered alterations subject to part 18 requirements in section 18.1 as follows:

“18.2 TYPES OF ALTERATION. An aircraft will be deemed to have been altered when

18.20(a) the aircraft structure has been changed, except in a manner which incorporates the use of a member or a portion of a member of greater strength than the original member in accordance with Civil Aeronautics Manual (CAM 18), or when

18.21(b) any change has been made in the engine, propeller, equipment or arrangement of equipment, which change may affect the balance, stability, local strength of supporting structures, or any other aspect of the airworthiness of the aircraft, or when

18.22(c) the engine has been altered, or when

18.23(d) the propeller has been altered.

As noted above, before 1942 the Federal regulations did not specifically define major and minor alterations. Rather, the regulations were written to cover only certain alterations, such as any alteration of an engine or propeller or an alteration that could “affect the balance, stability, local strength of supporting structures...” When the first definitions of major and minor alterations appeared in 1942 the approach taken was the reverse of the current major/minor repairs approach. “Minor alterations” was defined in some detail, while “major alterations” were “all alterations not within the definition of minor alterations.” Before a 1952 revision of part 18, the definitions of major and minor alterations were reversed to parallel the definitions of major and minor repairs, that is, a minor alteration became “an alteration other than a major alteration.”

As the quote from the 1941 memo cited above indicates, the major/minor distinctions have caused problems from the earliest Federal attempts to regulate aviation safety. Apparently of significant concern was the requirement for an inspection by an authorized representative of the Administrator before an aircraft could be returned to service after a major repair or major alteration (this term was being used in memos even though it was not contained in the rules). This requirement was proving to be very burdensome and the CAB was seriously considering amending the regulation to eliminate

that requirement in certain cases. A draft revision of a proposed rule to accomplish this was circulated to over 900 potentially interested persons (repair station operators, air carriers, etc.) and public meetings to discuss the issue were held in Tulsa, Oklahoma, on April 27, 1940, and in St. Paul, Minnesota, on July 15, 1940.

Ultimately this change is reflected in a 1952 publication of part 18 (issued by the CAB March 31, 1952, effective June 15, 1952) in which § 18.11(b) permitted major repairs and major alterations to be examined, inspected, and approved by either an authorized representative of the Administrator, or an appropriately rated certificated repair station.

§ 18.11(b) reads as follows:

“(b) *Major repairs and major alterations.* No airframe, powerplant, propeller, or appliance, which has undergone any major repair or major alteration, shall be returned to service until such repair or alteration has been examined, inspected, and approved as airworthy by one of the following:

- (1) An authorized representative of the Administrator, or
- (2) An appropriately rated certificated repair station, if the work has been performed by such repair station in accordance with a manual, specification, or other technical data approved by the Administrator,<sup>4</sup> or

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<sup>4</sup> Major repairs and major alterations whose design has not previously been approved by the Administrator may require the submittal of technical data and/or flight tests in order to establish compliance with the applicable airworthiness provisions. Examples of such major alterations for which it would be desirable to contact a representative of the Administrator prior to accomplishment of the alteration are given in Civil Aeronautics Manual 18.

By the early 1950's the CAB's definitions of major/minor repairs or alterations had matured to a point that with only slight rewording in the 1960's recodification they are identical to the current definitions. The words excluding alterations “not listed in the aircraft, aircraft engine, or propeller specifications” were added to the definition of major alteration when former part 18 was codified into present part 43. The explanation for the addition of these words was that it would make the definition “consistent with Appendix A of part 43 [new].”

The Appendix A of part 43 referred to above was added as part of the FAA's 1960's recodification of all of the regulations it had inherited from its predecessor agencies. The material included in Appendix A had previously appeared in Civil Aeronautics Manual (CAM) material issued by the Department of Commerce's Administrator of Civil Aeronautics to supplement the CAB's rules in their part 18.

A footnote to § 18.1 in the CAB's June 15, 1952, publication of part 18 stated:

The Administrator publishes Civil Aeronautics Manual 18 which lists operations considered to be maintenance, preventive maintenance, minor and major repairs, and alterations, sets forth acceptable procedures, methods, and practices under the provisions of this part.

Earlier versions of the CAB's part 18 contained similar statements.

It is not clear from the historical record to what extent the major/minor examples in CAM 18 were intended to be rules or guidance. The fact that the FAA codifiers included this material as Appendix A to part 43 rather than in the FAA's then new Advisory Circular system, indicates that the codifiers considered the examples more mandatory rule than guidance. To some extent, this treatment may have exacerbated the many problems that had historically confused the major/minor demarcations.

However, not all of the material related to major and minor classifications was transferred from CAM 18 to Appendix A. The lists of examples of minor repairs and minor alterations, which had existed in CAM 18, were not made part of Appendix A during the recodification.